

ON SOME FOSSIL PLANTS FROM DUBBO, NEW SOUTH WALES.

PLATE IX.

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While attempting to determine the geological position of the so-called Hawkesbury Sandstone at Dubbo, I have been gradually led to study the fossil plants which are so abundantly represented in the district. A few years ago I submitted my collection of fossils to the Rev. J. E. Tenison-Woods, who identified the species already known at that time. Shortly afterwards he gave a diagnosis and figures of all the new species in a paper entitled, "The Fossil Flora of the Coal Deposits of Australia," published in Vol. VIII. of our Proceedings. The following is a list of the fossil plants described therein :

FILICES.

- Sphenopteris crebra*, Ten.-Woods. Ballimore.
Sphenopteris glossophylla, Ten.-Woods. Ballimore.
Neuropteris australis, Ten.-Woods. Ballimore.
Thinnfeldia odontopteroides, Morris. Dubbo.
Thinnfeldia media, Ten.-Woods. Dubbo.
Alethopteris Currani, Ten.-Woods. Ballimore.
Alethopteris concinna, Ten.-Woods. Ballimore.
Merianopteris major, Feistm. Ballimore.

CONIFERÆ.

- Walchia milneana*, Ten.-Woods. Ballimore.

Since the publication of the paper referred to, I have collected fossils from many parts of the district. Of these some are well-known species, but others cannot be referred to any hitherto described Australian forms.

ODONTOPTERIS MACROPHYLLA, sp. nov. Plate IX., fig. 3.

Frond pinnate and bipinnate. Pinnules more or less opposite, obliquely ovate to ovate-acuminate, free, obliquely inserted by the whole base. No costa. Veins fine, all arising from the rachis,

dichotomous, diverging as they ascend, and numbering 30 to 33 at the margin. Length of longest pinnule, 10; width of base, 9. Length of specimen, 67: all millimetres.

Loc. Dubbo.

This beautiful and undoubted species of *Odontopteris* (Brongniart) is very different from M'Coy's *O. microphylla*, from which it is easily distinguished by its greater size and general habit. The Dubbo species was found in a shaft sunk on the Railway line at 275 miles 25 chains. It is common in a dark carbonaceous shale, associated with *Thinnfeldia odontopteroides*, *Hymenophyllites dubia*, and *Alethopteris australis*.

I am of opinion that many of the very fine impressions on the Dubbo Sandstones, considered to be some species of *Thinnfeldia*, can be referred to this genus. On Plate IX., fig. 4A, I have reproduced a pinnule of *Thinnfeldia odontopteroides* from Dr. Feistmantel's "Palaeozoische und mesozoische Flora des östlichen Australiens," for comparison with a pinnule of *Odontopteris*. In mere impressions or casts, showing no trace of the venation, the one cannot be distinguished from the other. The differences, however, are very great. In *Thinnfeldia* the veins arise, partly from one, which is almost median, and partly from the rachis; while in *Odontopteris* all the veins come direct from the rachis.

ALETHOPTERIS AUSTRALIS. Morris (as Pecopteris).

Refs.—Strzelecki, Ph. Desc. of New South Wales, pl. VIII., figs. 1, 2, 2a. M'Coy, Palæ. Vict., pl. XIV., fig. 3, p. 17.

Feistmantel quotes this fern from the Clarence River—the only locality hitherto known for it in N.S.W. There can be no doubt as to its identity; as in the case of *Thinnfeldia* and *Hymenophyllites*. I have been able to mount some pinnules on microscopic slides, so that the venation can be followed as easily as in a recent fern.

Loc. Same as proceeding.

THINNFIELDIA ODONTOPTEROIDES. Feistm. Pl. IX., fig. 4.

Refs.—Proc. Linn. Soc., N.S.W., Vol. VIII., p. 162.

This fossil plant has been described and figured in almost every variety by Dr. O. Feistmantel in the work already referred to. As Feistmantel's papers are not easily procurable, and as *Thinnfeldia* is (in Australia) a recognised characteristic mesozoic fossil, I herewith present a figure of a specimen, from Garensey's Quarry, Dubbo, where it is very common. It is confined to a particular bed—a sparsely micaceous, finely bedded, friable sandstone. It occurs, either in the shape of sharply defined casts, which show *Thinnfeldia* to have been a plant with stout coriaceous pinnules, or as a red impression (peroxide of iron), which is reduced to dust by exposure.

In a shaft sunk on the Railway, about three miles from the Quarry, *Thinnfeldia* fossils are found in a remarkable state of preservation, in a black carbonaceous shale. The shale may be truly described as consisting almost entirely of plant remains. As the shale is taken out fresh it is not easy to see the fossils, but as the stone weathers they peel off in flakes. It is only necessary to steep them in water, and pinnule separates from pinnule and rachis from rachis so perfectly, that they may be mounted on microscopic slides as translucent objects. Many of them can readily be used as negatives to obtain nature-printed heliotypes. Pl. IX., fig. 4, is an enlarged copy of one.

Some of the pinnules are studded with minute dots, which may be stomata. Although I have examined more than 50 specimens by transmitted light, I have never met with anything which could be considered as pointing to the mode of fructification, of which nothing is known. That this should be so, is remarkable, notwithstanding all that has been written, and the great number of plants that have been examined during the last forty years. It lends some weight to the opinions of Ettingshausen and Andrea, who placed *Thinnfeldia* with the Conifers. It is not easy to see the reason for this, for it appears amongst ourselves to be a settled question, that *Thinnfeldia* was a fern. I have to add the

following localities as new :—Beni, Talbragar R., Macquarie R., between Wellington and Dubbo, 16 miles from the latter place. In both instances the specimens were not perfect enough for specific determination.

HYMENOPHYLLITES DUBLA. Nov. sp. Pl. IX., figs. 1 and 2.

This cannot, with the material in hand, be distinguished from *Sphenopteris digitata* of Phillips. (See Geology of Yorkshire. 2nd Edit. Part I. Plate VIII., figs. 5 and 6.) Nothing was known of the venation of the Yorkshire species. In the Dubbo species, however, a nervure can be made out, which is divided and continued into each lobe. It certainly belongs to the Sphenopteridæ and for the reason stated, I consider it a species of *Hymenophyllites*. As more perfect specimens will doubtless come to hand, I content myself for the present with figuring the species. Phillips' species is derived from the sandstones and shales of Gristhorpe and Scalby (Jurassic.)

Loc. From a well, West Dubbo.

CYCADACEÆ.

PODOZAMITES. Sp.

Prof. M'Coy described (Pal. Vict., p. 33, pl. 8, figs. 1, 2, and 5) a species of *Podozamites* which was associated with *Alethopteris Australis*, and with which the Dubbo specimen will, I think, be found identical. I collected only one example, and that a fragment, but parallel nerves rapidly constricted at the base were easily noticeable, and at once separate it from *Zamites*—the one other form which it approaches. *Loc.* Railway shaft, associated with *Thinnfeldia odontopteroides*, *Alethopteris Australis*, *Odonopteris macrophylla* and *Podozamites*?

CONIFERÆ.

WALCHIA PINIFORMIS (?). Sterenberg.

Refs. Fl. d. Vorw. i. p. 22. Goeppert, Foss. Flor. de Perm., pl. 49, fig. 13.

Twigs of this are found in water-worn pebbles of an indurated fireclay in the Talbragar R. It differs from *Walchia Milneana*,

Ten.-Woods, in having its leaves linear to lanceolate and curved inwards at the apex. A few of the specimens show that the stems were flexible, reminding one of some of the Lycopodiaceæ. One species can hardly be distinguished from one figured by Mr. Twelvetrees, from the Upper Permian of Eastern Russia. (Qt. J. Geol. Soc., Lond., Vol. 38, p. 498, pl. 21, fig. 4.)

In conclusion I may remark that there are some forms which we should expect, which are not as yet recorded from Dubbo, notably *Taniopteris*.

With the foregoing list, imperfect as it is, it would be an easy matter to make some attempt to correlate the Dubbo and Ballimore beds with other well-known formations; this I propose to attempt in another paper.

EXPLANATION OF PLATE IX.

- 1.—Hymenophyllites dubia.
- 2.—A few lobes of same as seen by transmitted light.
- 3.—Odontopteris macrophylla and Thinnfeldia.
- 4.—Thinnfeldia odontopteroides, from Dubbo.
- 4A.—Pinnule from Feistmantel.

NOTES AND EXHIBITS.

Mr. Ramsay exhibited a fine collection of Marine animals in illustration of the new and excellent methods of mounting and preserving specimens in use by Senor Lo Bianco, at Dr. Dohrn's Zoological Station, Naples. Among the exhibits were *Trachypterus tenia*, *Torpedo ocellata*, *Pennaria Carolinii*, *Eudendrium ramosum*, *Zoobotryon pellucidum*, *Pennatula phosphora*, *Autidon rosacea*, *Chromodoris elegans*, *Pleurophyllidea lineata*, *Pyrosoma elegans*, *Cestus Veneris*, *Rhizostoma pulmo*, and many other beautiful preparations.

The President exhibited a portion of the lower jaw of a *Diprotodon* which had been found near Armidale by Mr. W. M. Harris. It was interesting to note the occurrence of the remains of this gigantic extinct marsupial on the summit of the Great Dividing Range as well as on the low-lying plains of the Darling District.